

80 Rec'd PCT/PTO 11 JUN 1999

18

Art = 34.

CLAIMS

1) A fluid control/mixing valve including:

- Sub 1*
- a valve body;
 - a first disk member defining at least two first apertures communicating with at least two corresponding fluid supplies or outlets;
 - a second disk member defining at least one second aperture;
 - wherein the first and second disk members are arranged in sealing contact and are variably alignable in a coaxial, constrained manner, so that the first and second apertures are, in turn, variably alignable such that fluid may flow through the at least two first apertures only when there is an overlap between first and second apertures, and such that the flow through the or each second aperture may be varied by variable coaxial alignment of the first and second apertures.

2) A fluid control/mixing valve as claimed in Claim 1 wherein the torque between the first and second disk members is such that their relative coaxial rotation may be effected by means of a stepper motor, ^{DC} motor or the like.

3) A fluid control valve as claimed in Claim 1, wherein the first disk member includes at least one sealing region suitable to facilitate sealing between the first and second disk members.

4) A fluid control valve as claimed in Claim 2, wherein the first disk member includes at least one friction reducing region consisting of an indented region to reduce the area of contact between the first and second disk members.

5) A fluid control valve as claimed in Claim 3, wherein the at least one friction reducing region is substantially defined by a sealing region arranged around the periphery of the first disk member.

6) A fluid control valve as claimed in Claim 4, wherein the at least one friction reducing region includes at least one region extending radially to the periphery of the first member.

7) A fluid control valve as claimed in ~~any one of the preceding claims~~, wherein the or each first aperture is substantially sector shaped.

8) A fluid control valve as claimed in ~~any one of the preceding claims~~, wherein the or each second aperture is substantially sector shaped.

9) A valve as claimed in ~~any one of the preceding claims~~, wherein the valve is arranged such that variable alignment of the first and second disk members is brought about by relative rotation of the first and second members.

10) A valve as claimed in Claim 8, wherein the second disk member is rotatable within a cylindrical region.

11) A valve as claimed in ~~any one of the preceding claims~~, wherein the second disk member is substantially in the form of a disk having one or more removed sector(s).

a 12) *claim 1* A valve as claimed in ~~any one of the preceding claims~~, wherein the first disk member is substantially of the form of a disk having at least one removed interior region.

a 13) *claim 1* A valve as claimed in ~~any one of the preceding claims~~ including a pipe having an internal bore into which the first disk member sealingly fits such that fluid is constrained to passing only through the inlet apertures.

a 14) *claim 1* A valve as claimed in ~~any one of the preceding claims~~ including at least one electric motor arranged to actuate the relative alignment of the first and second disk members.

15) A fluid control/mixing valve communicating with at least two fluid supplies, including:

- at least two valve subunits, each subunit including a first disk member having at least one first apertures and a second disk member having at least second apertures, and leading to one outlet, and wherein fluid flow from the at least one first aperture is controllable by variable coaxial, constrained alignment of the first and second disk members;
- at least one electric motor arranged to actuate the variable alignment of first and second disk members for one or more valve subunits simultaneously and in a manner adapted to control and provide a specified fluid characteristic; and
- an outlet manifold having one or more manifold outlets.

a 16) *claim 13 14* A valve as claimed in ~~Claims 13 or 14~~, wherein the at least one electric motor is a stepper motor.

21

claim 15
a 17) A valve as claimed in ~~any one of Claims 13 to 15~~, including at least one gear to facilitate the actuation for variable alignment of the first and second disk members.

claim 15 14
a 18) A valve as claimed in ~~any one of Claims 13 to 16~~ including a controller to control the at least one electric motor and thereby the flow from the or each of the first apertures.

13
19) A valve as claimed in Claim ~~17~~, wherein the controller includes a microcontroller.

13
a 20) A valve as claimed in Claim ~~17 or Claim 18~~, including at least one sensor to sense at least one parameter of the fluid(s).

20
21) A valve as claimed in Claim ~~19~~, wherein the controller is arranged to control the flow from the or each of the first apertures and to receive information from the at least one sensor to control at least one of the at least one parameter of fluid leaving the valve.

20
a 22) A valve as claimed in Claim ~~19 or Claim 20~~, wherein the at least one given parameter includes temperature information.

claim 19
a 23) A valve as claimed in any one of ~~Claims 17 to 21~~, wherein the controller is arranged suitably to estimate flow taking into account at least the position of the stepper motor.

claim 1
a 24) A valve as claimed in ~~any one of the preceding claims~~, including an outlet manifold having two or more manifold outlets.

22

25) A valve as claimed in Claim ²⁴~~23~~, wherein the ^{two}~~one~~ or more manifold outlets include valves to allow or prevent flow from the respective manifold outlets.

²⁰
~~claim 19~~
a 26) A valve as claimed in ~~any one of Claims 19 to 24~~, including a user interface adapted to receive information on the at least one parameter of fluid leaving the valve.

^{claim 1}
a 27) A fluid control valve as claimed in ~~any one of the preceding claims~~, including a single first aperture and at least two second apertures arranged such that variable alignment of the first and second members allows variable diversion of fluid through each of the at least two second apertures.

28) A fluid control valve including:

- at least two outlets;
- at least two fluid control valves as claimed in Claim 26, wherein one second aperture of each fluid control valve communicates with one or the other of the two outlets.

29) A valve as hereinbefore described with reference to any one of the embodiments shown in the accompanying drawings.

30) A valve assembly substantially as hereinbefore described with reference to any one of the embodiments shown in the accompanying drawings.

- 31) A servo valve system substantially as hereinbefore described with reference to any one of the embodiments shown in the accompanying drawings.
- 32) A combined mixing and diverting valve substantially as hereinbefore described with reference to Figures 17 to 20.

LC:VO:TSPEC43930

File Ref: 501578-142

Add B's

Add E'